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E72-10170
CR-128361

Phase I Report - August thru September 1972

EVALUATION OF ERTS DATA FOR CERTAIN HYDROLOGICAL USES

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ERTS Proposal NASA No. 109

GSFC ID No. C0313

Task No. 432-641-14-04-03

(E72-10170) EVALUATION OF ERTS DATA FOR
CERTAIN HYDROLOGICAL USES Phase Report,
Aug. - Sep. 1972 D.R. Wiesnet, et al
(National Environmental Satellite Service)
Sep. 1972 4 p

N73-10351

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CSCL 08H G3/13

Objective:

The overall objective of this investigation is to evaluate ERTS data for hydrologic information in two areas in which extensive ground truth is available.

a. Sierra Nevada studies.--Here the objective is to evaluate ERTS data from a mountainous region with extensive ground truth and where a prolonged melting snowpack is the primary source of surface runoff to a highly managed river system. To determine--by comparing satellite and ground truth data--the feasibility of indirect quantitative assessments of water storage in reservoirs and possibly in the snowpack as snow. Snow mapping in mountainous terrain is an extremely challenging task.

b. Lake Ontario (IFYGL) studies: Here the objective is to assess in a quantitative way, the ERTS data from a temperate region lake and from its drainage basin, in terms of hydrologic information content, relating ground truth to spectral band, ground resolution, etc. Coincident use of ITOS-D imagery and data will permit evaluation of the effect of the 18-day revisit cycle on hydrologic phenomenologic monitoring.

Work Summary

a. Sierras.--Delay in securing the Zoom Transfer Scope from the manufacturer has postponed the projection from U-2 photographs onto basin maps of the 1971-72 Sierra snow season. Delivery of the Color Additive Viewer in late August allowed sufficient time for indoctrination to the viewer and for some analysis of ERTS-1 imagery containing snow-covered mountains. The imagery was obtained through our (NOAA's) ERTS data center. Preliminary findings indicate that snowline determination is possible with ERTS. Data in the form of 70 mm chips were received late in September from the NTFF, but unfortunately were most cloud-filled.

b. Lake Ontario Basin.--Though the only imagery received from the NTFF contained too many clouds to be of much use, relatively cloud-free views of the area were received from later orbits through NOAA's ERTS data center. Plans are continuing for the October ERTS underflights by the NOS aircraft of the Oneida and Scipio - Fleming test sites to be made in conjunction with an ERTS pass and the NWS - AEC airborne gamma-ray survey.

c. General.--The principal investigator presented a short talk at the GSFC ERTS seminar on September 29, 1972, entitled "Detection of Snow Conditions in Mountainous Terrain." The use of different ERTS MSS bands to detect areas of melting snow as well as the areal extent of snow was stressed.

Work Plans.--Delivery of the Zoom Transfer Scope is anticipated in November and will permit snowline-basin mapping of the Sierra Nevada test site using U-2 imagery. In the Lake Ontario Basin multispectral underflights will be coordinated with the NWS and IFYGL ground measurements as well as with an ERTS pass and the NWS-AEC airborne gamma-ray survey for soil moisture determination.